PrEP and Electronic Medical Records: Examples from New York City

Zoe Edelstein, PhD MS
Biomedical Summit
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PrEP Measurement and Program Evaluation

What?

- Key measures: PrEP prescription or referral, PrEP candidacy/eligibility, PrEP-related medical services, retention (follow-up visits), medication adherence
- Other information of interest: sociodemographic factors, STIs, referral for services
- Analyses: trends; associations; programmatic reach and patient outcomes

How?

- A few decision points:
  - Retrospective vs. prospective
  - Current record system vs. new system
  - Individual program vs. system-wide vs. multi-site vs. jurisdictional (public health)
  - Parsimonious vs. exhaustive
  - Patient care vs. program evaluation
## Road Map of Whirlwind Tour

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<tr>
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<td>![Retrospective Image]</td>
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<td>![Prospective Image]</td>
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• The “hub” is an innovative system that connects to electronic health records (EHRs) of providers using EHR vendor eClinicalWorks

• Citywide practice reach and patient coverage
  • 720 practices
  • 2,645 providers active in 2016
  • 2.0M patients with visits in 2016

• Extracts EHR data in aggregate form
  • Secure and confidential

• Applied an algorithm to identify PrEP prescribing

• Outcome: PrEP prescription rates
  • Calculated per 100,000 patients seen
  • Stratified by select patient- and practice-level factors
PrEP prescription algorithm

FTC/TDF prescription

- ICD-9/10 codes for prior diagnosis of HIV or HIV-related opportunistic infections; concomitant prescription of other antiretroviral(s)
- ICD-9/10 codes for prior diagnosis of hepatitis B
- ICD-9/10 codes for “contaminated needle stick” or “prophylaxis”

Exclusions

- HIV Treatment
- Chronic Hep B Treatment
- PEP Provision

Classified as PrEP prescription
**PrEP prescription rates per 100,000 patients seen in 602 ambulatory care practices, overall, NYC, 2014-2016**

![Graph showing PrEP prescription rates per 100,000 patients seen from Q1 2014 to Q2 2016, with a significant increase from 38.9 to 418.5 prescriptions per 100,000 patients seen.]

Salcuni P., Smolen J., Jain S., Myers J., Edelstein Z., ID Week 2017

*Increase is statistically significant (p<0.05).*

New HIV cases reach historic low in New York City after rate of people taking preventative drugs surged 1,000%

- A report released today by the New York City Department of Health showed 2,279 new diagnoses were recorded in 2016.
- That is a nine percent drop from the 2,493 new cases in 2015.
- Diagnoses among gay men dropped 15 percent from 1,450 new cases in 2015 to 1,236 new cases in 2016.
- But the rate of new diagnoses increased among women.

By MIA DE GRAAF | HEALTH EDITOR FOR DAILYMAIL.COM
PUBLISHED: 10:03 EST, 29 November 2017 | UPDATED: 10:06 EST, 29 November 2017
PrEP prescription rates per 100,000 patients seen in 602 ambulatory care practices, by sex, NYC, 2014-2016

*Increases across all strata are statistically significant (p<0.05), after adjusting for patient age and race/ethnicity, practice location and type, proportion of practice’s patients living in high poverty ZIPS, and number of ID specialists.

Salcuni et al; ID Week 2017.
PrEP prescription rates per 100,000 males seen in 602 ambulatory care practices, by race/ethnicity, NYC, 2014-2016

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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<tbody>
<tr>
<td>White</td>
<td>189.9</td>
<td>51.8</td>
<td>2508.5</td>
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<tr>
<td>Black</td>
<td>112.6</td>
<td>44.0</td>
<td>868.6</td>
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<tr>
<td>Hispanic/Latino</td>
<td>51.8</td>
<td>39.5</td>
<td>709.5</td>
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<tr>
<td>API</td>
<td></td>
<td></td>
<td>654.8</td>
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<tr>
<td>Other</td>
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<td>468.5</td>
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Increases across all strata are statistically significant (p<0.05), after adjusting for patient age, practice location and type, proportion of practice’s patients living in high poverty ZIPs, and number of ID specialists.

Salcuni et al; ID Week 2017.
• Largest health care system in the Bronx

• Data extracted includes all HIV tests (2011-2015)

• Among those with negative HIV test and FTC-TDF prescription, conducted a medical chart review to confirm PrEP prescription

• Used standardized data dictionary and chart abstraction tool

• Result: 177,525 with HIV neg test; 2064 prescribed FTC-TDF; 108 prescribed FTC-TDF for PrEP
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Measuring PrEP by Influencing Input into Current EHR

New York Presbyterian Hospitals

• Identified billing codes that will work within system for PrEP and PEP, to measure uptake and related measures

• Influencing use through directly reaching out (one-on-one discussions), trainings on PrEP/PEP and data feedback loop

Personal Communication. Caroline Carnevale.
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Modification to EMR for New PrEP Services and Protocols
Sexual Health Clinics, NYC DOHMH Bureau of STD Control

• 8 Sexual Health Clinics throughout NYC

• Custom EMR system
  • Updated to meet program needs
  • Clinic staff enter data in real time
  • Links to laboratory and patient portal
  • Analysts generate reports and analyses

• EMR modified as PrEP services added
  • PrEP initiation, roll out began Dec 2016

Personal Communication. Trevor Hedberg, Preeti Pathela, Christine Borges.
Modules Support Each Step in PrEP Patient Clinic Flow
Sexual Health Clinics, NYC DOHMH Bureau of STD Control

- Patient/test information collected at each step entered into EMR
- Programmed algorithms dictate clinic workflows

*Patients contacted by DOHMH to come to clinic must be seen by EPI staff before receiving PrEP navigation*
Navigation’s main objective: informed decision about whether to pursue PrEP

Navigators follow up with the facility and patient to assess initiation/retention

Patient Counseling

Active referral with linkage agreement

Record of follow-up

Side effects and adherence
PrEP Metrics Derived from EMR
Sexual Health Clinics, NYC DOHMH Bureau of STD Control

- Volume, by step; number of:
  - Patients eligible at triage, by eligibility group
  - Patients offered, accepted, refused, received navigation
  - Patients initiated PrEP medication
  - Visits that include PrEP navigation
  - Visits with documented PrEP referral

- PrEP referral outcomes:
  - Number of patients referred
    - Overall and PrEP initiates vs. referrals only
  - Number and % attended appointment

**PrEP Navigation**
IN ALL 8 CLINICS
> 4,700 Encounters

**PrEP Initiation**
NOW AT 5 CLINICS
641 PrEP Starts
58% Black/Latinx
Other NYC Examples of EHR Modification
Montefiore (EPIC) and Ryan Network (eClinical Works)

Montefiore- Screening Tool, SmartSets

Ryan Network- Note Template, Autopopulation, Order Sets

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PrEP Program Data Collection Outside of EHR

• Many PrEP programs use a separate data entry system – especially common at program initiation – e.g., Access database, REDCap

Example of EHR/Separate System hybrid from NYP

• Multi-site PrEP program (5 sites;~1500 clients)
• Dashboard combines automated extraction of EHR data and manually entered data
• Extracts data on last HIV test for record of follow-up (overdue for visit if >3 months ago)
• Real-time monitoring of PrEP program and also serves as workflow for navigators

Personal Communication: Sarit Golub and Caroline Carnevale.
Summary - Lessons Learned (1)

• No one perfect system for evaluation of PrEP through EHR

• Retrospective
  • Data are available
  • Limited by analyst time/capability and by what was recorded and where

• Prospective
  • Many PrEP programs have developed monitoring tools
  • Most still rely on some data collection outside EHR
  • Adding modules may have operational challenges, and
  • Use more likely among PrEP programs/champions than others
Summary - Lessons Learned (2)

- For new record systems, wherever possible:
  - Automate/auto-populate
  - Marry patient care data collection with program evaluation data collection
  - Be thoughtful (look ahead) and parsimonious

- Share results with clinical stakeholders to motivate use of data collection tools, to drive quality improvement and to improve patient/program outcomes

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**Physician Time Distribution During Office Hours, by Task Category**

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<thead>
<tr>
<th>Task Category, by Activity During Office Hours</th>
<th>Time Spent (95% CI), %</th>
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<tbody>
<tr>
<td>Direct clinical face time</td>
<td>Total*</td>
</tr>
<tr>
<td>With patient</td>
<td>33.1 (31.9-34.5)</td>
</tr>
<tr>
<td>With staff and others (patient not present)</td>
<td>27.0 (25.8-28.3)</td>
</tr>
<tr>
<td></td>
<td>6.1 (5.7-6.5)</td>
</tr>
<tr>
<td>EHR and desk work</td>
<td>49.2 (47.8-50.6)</td>
</tr>
<tr>
<td>Documentation and review</td>
<td>38.5 (37.2-39.8)</td>
</tr>
<tr>
<td>Test result</td>
<td>6.3 (5.8-6.8)</td>
</tr>
<tr>
<td>Medication order</td>
<td>2.4 (2.2-2.5)</td>
</tr>
<tr>
<td>Other order</td>
<td>2.0 (1.9-2.2)</td>
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*Significant at p < 0.05.

Acknowledgements

Julie Myers  
Paul Salcuni  
Preeti Pathela  
Trevor Hedberg  
Christine Borges  
Bisrat Abraham  
Sue Blank  
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Viraj Patel  
Carly Skinner  
Sarit Golub  

Thank you!

Contact: Zoe Edelstein zedelst1@health.nyc.gov

NYC DOHMH Capacity Building Assistance  
Contact: Melanie Graham, mgraaham6@health.nyc.gov

NYC Capacity Building Assistance Project
PrEP Supplemental Triage Card
NYC DOHMH Sexual Health Clinics

- Triage card information entered into EMR
- Used to determine subsequent clinic flow